GEOLOGICAL OCEANOGRAPHY LABORATORY (LOG-IO/FURG)

LOG-IO is one of the most traditional and known geological oceanographic research units in Brazil. During the last 30 years the research and staff develops studies of sedimentology, geochemistry, paleontology and morphodynamic focusing on the southern Brazilian ecosystem.

Geological Oceanography Laboratory

Main Characteristics of the different LOG divisions :

1- GEOCHEMISTRY DIVISION (GD)

In this division a group of experienced researchers conduct applied and academic research oriented to geochemistry process focusing on organic, metals, and environmental geochemistry as well as in the geochemistry of old and recent sediments.

Research Group

Prof. Nicolai Mirlean (PhD in Geochemistry - Moscow University)

Prof. Paulo Baisch (PhD in Geochemistry - Université de Bordeuax I)

Prof. Isabel Machado (PhD in Chemistry – UFPel/Brazil)

Major research lines (and education) in Geochemistry :

- Organic geochemistry and organic biomarkers
- Heavy metals geochemistry
- Marine geochemistry and Hydro geochemistry
- Geochemistry processes of the supergene zone.
- Environmental geochemistry
- Biogeochemistry
- Aliphatic and aromatic hydrocarbons
- Bioremediation and degradation of hydrocarbons

Practice field

Researchers of the Geochemistry division (GD) have been working for more than 25 years with organic and inorganic geochemistry in several national and international projects related to environmental geochemistry, impact characterization, geochemistry of organic and inorganic compounds and metals quantification and behavior. This division also stands out for its high experience in scientific projects related to the oil and gas industry educating and forming people through a human resources project called PRH 27 sponsored by the Oil National Agency (ANP). Main areas of specialization are organic geochemistry, aliphatic and aromatic hydrocarbons and geochemical biomarkers. **PRH 27**

Additional activities of the GD-LOG are linked to the development of Environmental Impact studies and reports related to mining activities ,harbor and civil construction and effluent emission according the needs of companies and industries.

Laboratorial and Analytical Capacity

This division has capability to collect any kind of soil, bottom and sub-bottom samples, water, atmospheric material, and biological samples. In analytical terms, this laboratory is also capable to carry out sample analyses within the quality parameters monitoring the analytical quality using certified samples. The laboratory area of the Geochemistry division comprises 800 m^2 which is spread out in the following sectors: reception and pre-treatment of samples; organic samples treatment sector; inorganic treatment sector; Ionic Chromatography sector; Gas Chromatography sector; Atomic Spectrophotometry sector; Spectrometry and Atomic Fluorescence sector

GS Laboratorial and Analytical Capacity

2- REMOTE SENSING SIGNAL ANALYSIS AND GEOPROCESSING DIVISION

Research group

Prof. Carlos Hartmann (PhD in Geosciences and MSc in Remote Sensing)

Prof. Carlos Tagliani (PhD in Geosciences)

Prof. Gilberto Henrique Griep (Specialist)

Profa. Rosa Picolli Cunha (Doutorado em Oceanografia Geológica

Main research lines:

- Planning and management of marine and coastal areas under a socio-environment approach.
- Systematic mapping evaluation of the Coastal Zone;
- Evaluation of sensor systems and platforms for application in coastal areas;
- Environmental Characterization of Marine and Coastal Ecosystems;
- Evaluate environmental monitoring programs;
- Territorial Planning.

Practice field

The team has more than 30 years of fieldwork on the coastal plain, as well as, in research cruises on board of oceanographic vessels acquiring and processing geophysical data in estuarine, continental shelf and deep-sea areas.

Main facilities

This division has a Computer Lab with ten (10) computers connected to the Internet in an appropriate room for a maximum of twenty (20) students. Twor (2) rooms for undergraduate, MSc and PhD students are also part of the LOG where programs for data processing and GIS Remote Sensing tools are available. Among the main software used, the following can be found: MegaGIS 2.0 – Brazilian geoprocessing program of easy access; MicroStation Power Draft – CAD system for digitalization of maps and nautical charts; IDRISI ; ARC VIEW 9.3; GeoMedia Profissional 6.0. Field equipment as a Total Station; GPS MNS navigation Brunton and shallow water sampling corer are located at this division.

Computer Lab and Halls of Residence for Students

3- SEDIMENTOLOGY AND COASTAL GEOLOGY DIVISION

Research Group

Prof. Lauro Calliari (PhD in Geological Oceanography)

Prof. Gilberto Griep (Specialist)

Prof. João Nicolodi (PhD in Marine Geology)

This division is considered a traditional and consolidated area of research in LOG-IO conducting studies in coastal and marine sedimentary processes related to recent and old age sediments. Coastal and estuarine morphodynamics with focus on beach processes regarding erosion, bar morphodynamics and storm surges are strongly highlighted since the obtained data is applied on coastal planning. Research studies related to marine mineral resources with emphasis in sand sources for beach replenishment, marine aggregates (calcareous deposits) and heavy mineral concentration and distribution on the continental shelf are underway. Additional studies on marine mineral resources includes phosphorite deposits and gas hydrate located in the upper continental slope. The division also supports all the grain size analyses requested for the different divisions and sector of the IO-FURG.

Main Research Lines

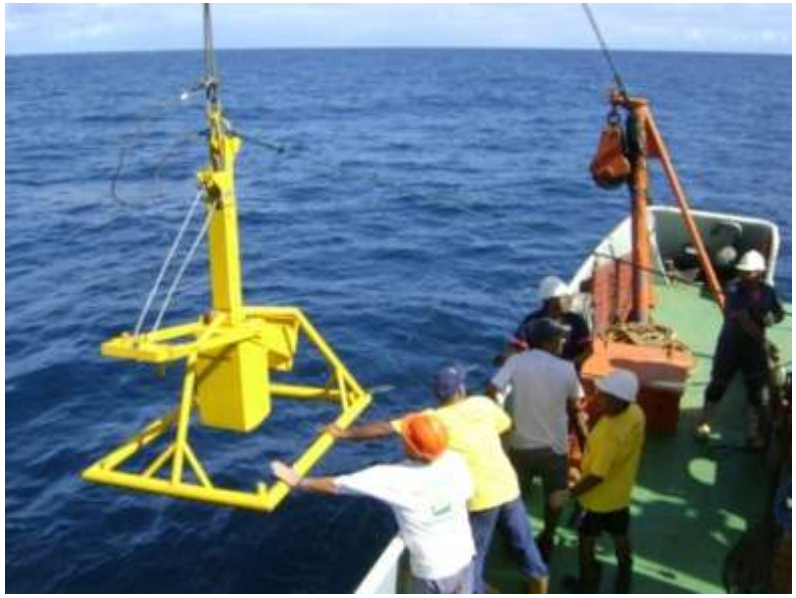
- Coastal and marine sedimentary processes
-Beach Morphodynamics
- Sedimentary evolution and coastal Modeling
- Marine mineral resources

Main Facilities

This division encompass an laboratory area of 160 m^2 where a complete sedimentology equipment for grain size analyses (sieve and pipeting), heavy mineral separation and core analysis are located. Additional equipment consists of: binoculars and petrographic microscopes. Two (2) main rooms with capacity for 6 students each (both at the undergraduate and graduate level) are also located at LOG-IO, serving as a base for the development of dissertations and thesis work under the advise of major professors. Several computer for digital image processing and specific coastal applied software are also available.

Técnica em Laboratório: Glória Paz Canteiro

Técnico Laboratorista : concurso a caminho.



Amostrador Box Core
Noc. Atlântico Sul

Sistema ARGUS-Praia do Cassino,RS

A video-image system for beach and surf zone monitoring consisting of four (4) digital cameras on a 14 m height tower located at Cassino beach is permanently linked to the LOG server collecting permanent data of the surf-zone during daylight hours (http://www.praia.log.furg.br). The main data base consists of snap shots, time average images (timex) and variance images. A enormous data base of surf-zone morphodynamics has been collected over the last five (5) years.

4 – Applied Geophysics Division

Research Group

Prof. Gilberto Griep (Specialist)

Prof. Lauro Calliari (PhD in Geological Oceanography)

Prof. Dr. Fernando Veiga –visitante

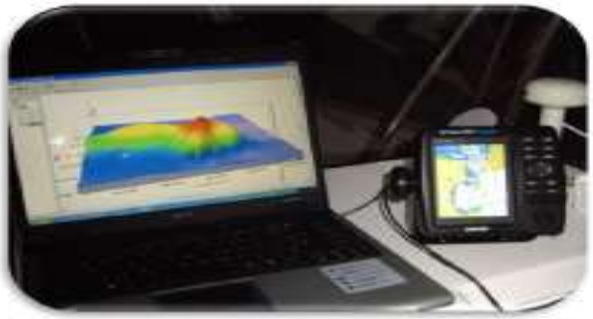
The activities developed by this division have been mainly focused on sub-bottom sediment characteristics, harbor bathymetry and bottom reconnaissance. Coastal evolution based on both seismic stratigraphy and shallow seismic is also one of the main research objectives. Aspects of harbor and channel siltation, bottom surveys adjacent to piers, pipeline deployment and location are frequently demanded by the state harbor division and private dredging companies. This division also support all the geophysical activities

Research lines

- Erosion and siltation of navigation channels of the Rio Grande Harbor
- Coastal evolution of the Rio Grande Coastal Plain and continental shelf.
- Case Studies on sedimentation of the Patos Lagoon Estuary
- Environmental studies in areas sand mining on rivers.

Main Facilities

A functional electronic laboratory is maintained by a electronic technician which keep up the following geophysical equipment: A high accurate Ecossounder – ODOM ECOTRACH with 200 kHz frequency; A subbottom profiler with a frequency of 3.5 kHz (CHIRP technology) and 33 kHz which can work at both shallow and deep waters; A Side Scan Sonar 300 kHz capable of operating in shallow waters; A shallow seismic system with a high resolution source Sparker eel of 32 hydrophones and a MERIDATA signal acquisition and processing data; A compound side-scan sonar system and multi-beam acoustic profiler C3D Teledyne Benthos coupled with a oceanographic winch DYNACOM with 2,400 m of cable length will also be part of the geophysical equipment that will be deployed by the IO-FURG research vessel Atlântico Sul. The software tools for processing the geophysical data consist of : Bathy 2010 from Syqwest; SONAR.Wiz from Chesapeak Techology; Geoprocessing software to data visualization. The main vessels supporting the research are: Research boat "Larus" and Research Vessel "Atlantico Sul"



Necessidade:
Técnico em eletrônica
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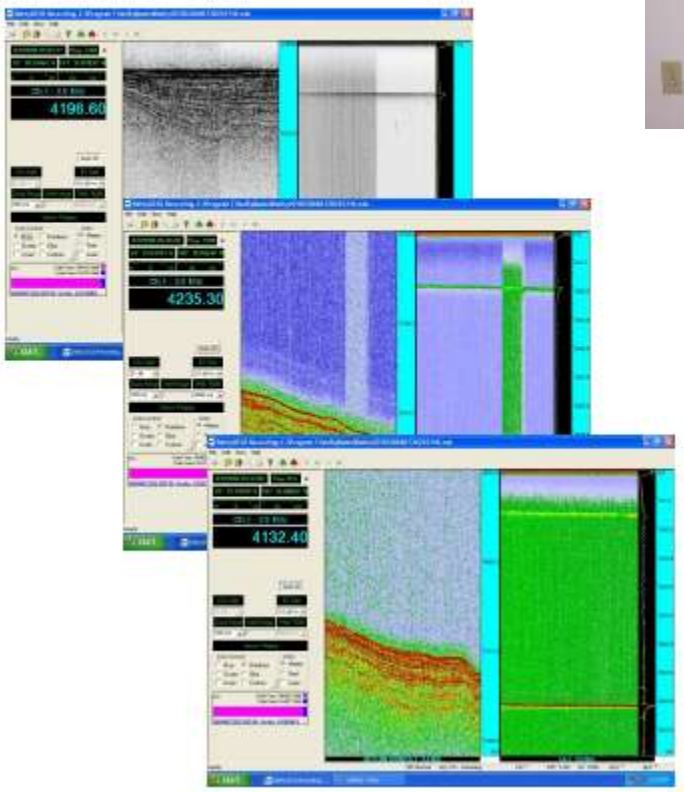
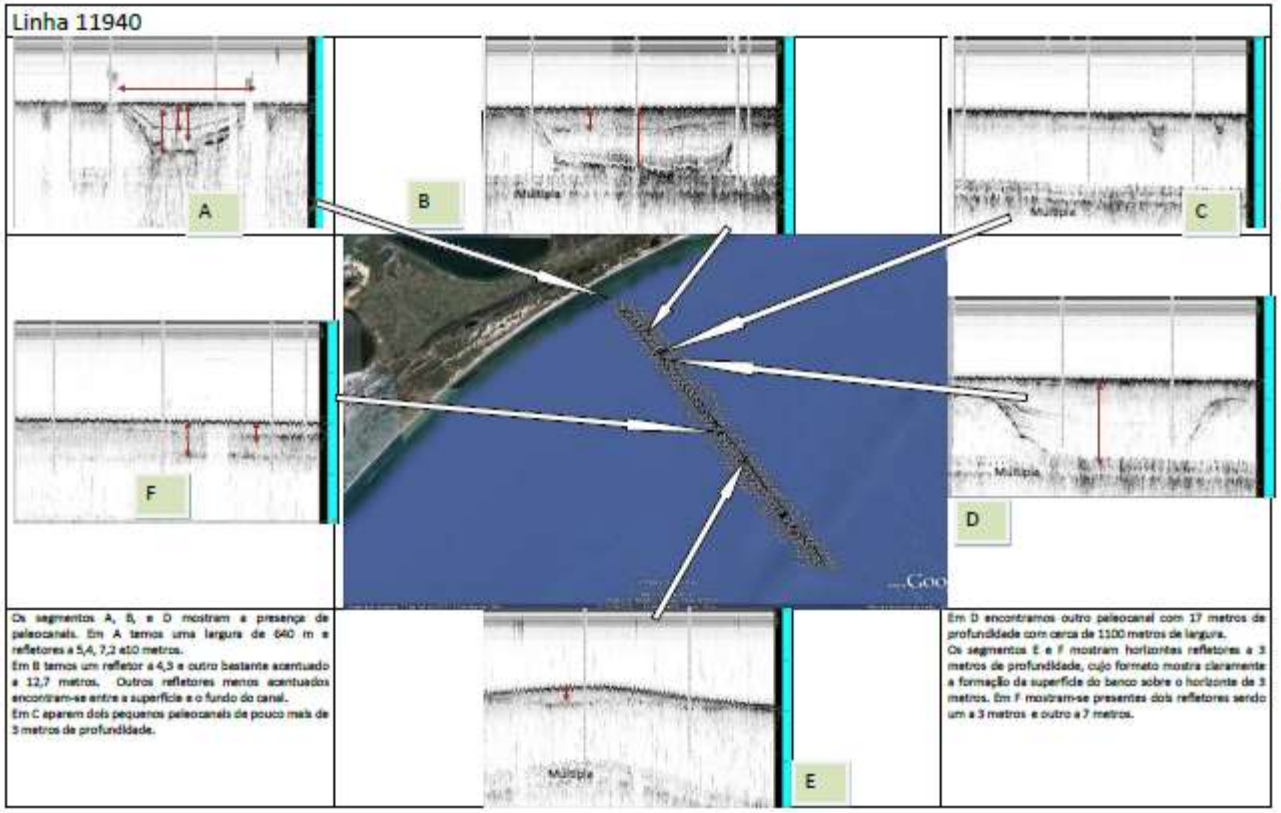
Bathy 2010 ™ CHIRP Sub-bottom Profiler
3.5 kHz e 33 kHz





Investimentos em geofísica marinha
Sísmica de Reflexão(plataforma e talude)

5 – Bioindicators and Palinofacies Division

- Profa. Msc Débora Pimental Diniz
- Concurso professor a caminho (1 vaga) Paleoceanografia

The Bioindicators Markers Laboratory has adequate space and equipaments to accomplish palinologic, palinofacies and petrography analysis from sediments and sedimentary rocks along all the Continental Margin. Recent research includes environmental analysis and stratigraphy of Patos Patos Lagoon and a deep sea feature called Rio Grande Cone. Researchers at this division has extensive experience in:

Palynological Cenozoic marine and continental sediments identifying a variety of different taxonomic palynomorphs; evaluation studies of dispersed organic matter (DOM) and its relation to organic facies and hydrocarbon generating potential; Characterization of coal in different Palaeozoic coalfields of south-Brazil and paleoenvironmental and paleoclimatic reconstructions.

Main Research Lines :

- Palynofacies of coastal and marine areas;
- Coastal and marine Quaternary Palimnology
- Organic matter Characterization
- Study of oil source deposits
- Reconstruction of the genesis of sediments;
- Stratigraphy and correlation of sediments;
- Paleoenvironmental and paleoclimatic reconstructions;

Main Facilities

This division has an area of about 80 m2, for studies of Palynology, petrography and organic palynofacies. It has a laboratory which includes: three microscopes, being two transmitted light microscope- LOBOMED-400 Olympus and one reflected light microscope with options for transmitted light and fluoresce-Leitz.

LOG(atividades educacionais)

- Curso de Graduação em Oceanologia
- Curso de Pós-Graduação em Oceanografia Física, Química e Geológica(IO)
- Curso de Pós-Graduação em Engenharia Oceânica
- Curso de Graduação em Engenharia Costeira-Portuária
- Curso de Graduação em Geografia
- Curso de Graduação em Biologia
- Curso de Pós-Graduação em Gerenciamento Costeiro Integrado (IO)
- Curso Técnico de Gerenciamento Costeiro (São Lourenço do Sul)
- Interação com o IF (estágios)
- Educação a distância.

6- METEOROLOGY DIVISION

The meteorology division maintain under its duty a complete meteorological station which is integrated to the Brazilian National Meteorological Institute- INEMET. It has been operating and maintaining a data base for more than thirty years. All the information and data provided by this division is used by all the oceanographic divisions and other research institutions along the Rio Grande do Sul (RS) state.